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2012 Annual Report July 1, 2011 through June 30, 2012

Virginia Institute of Marine Science

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2012 Annual Report

July 1, 2011 through
June 30, 2012



VIMS | **WILLIAM
& MARY**
VIRGINIA INSTITUTE OF MARINE SCIENCE

Science for the Bay
- IMPACT FOR THE WORLD

Letter from the Dean & Director



Dear Friends of VIMS,

The 2012 fiscal year was an exciting one at VIMS, highlighted by many scientific accomplishments and the dedication of a new Seawater Facility at VIMS' Eastern Shore Laboratory in Wachapreague.

The facility, which replaced dilapidated 19th-century buildings, will offer new opportunities in aquaculture and related fields that will impact Chesapeake Bay and beyond. Our Eastern Shore Lab, established more than 40 years ago, was instrumental in launching Virginia's clam aquaculture industry, which now leads the nation and brings millions of dollars into the Commonwealth.

I am pleased to report that VIMS is recovering nicely from the devastating budget reductions that began in 2008. Our total operating budget is about \$42,000,000—44% from state support, 52% from mostly federal grants and contracts, 2% from tuition, and 2% from private and miscellaneous sources. While it is unlikely that our state General Funds will ever be fully restored, the state has approved funding of a much-needed new research vessel and eight new faculty positions that will help

us rebuild from retirements and the mandated budget cuts. Bringing on a cohort of bright young scientists is vital to the future success of our faculty and research programs.

This report highlights many scientific advances and honors for our faculty and students who continue to be recognized as leaders in their fields. VIMS notes with pride that Professor John Milliman was honored as one of Virginia's Outstanding Scientists for his work on river sediments and their chemical signatures; Professor Deborah Bronk, on leave from VIMS, was appointed to a prestigious position as Head of the Ocean Sciences Section at the National Science Foundation; and Professor Robert Diaz was named vice-chair of an important advisory group to the federal Bureau of Ocean Energy Management. As has been the case in recent years, VIMS is highly competitive in the federal-grants arena and continues to deliver objective and up-to-date science that federal, state, and local policymakers depend on to inform public policy. One pertinent example is our work on sea-level rise and storm modeling, which

is increasingly in demand from all levels of government and by the private sector.

Private gifts received in 2012 are truly making a difference in the margin of excellence for the Institute, and we are grateful for gifts at every level. A number of recent gifts and their impacts are highlighted in this report.

We now have 36 separate endowments in the VIMS Foundation that support research programs, professorships, and student fellowships. In fiscal year 2013, Foundation fellowships will support 27 students. Total assets of the VIMS Foundation reached \$9.4 million as of June 30, 2012 (and as this report goes to press, \$10.4 million). In times of unpredictable public funding, building the Foundation for support of our work is a top priority.

Particularly notable this year were two of our largest gifts in the VIMS Foundation, both to establish endowments that will advance our work for many years to come. The Herndon Foundation, a Gottwald family foundation, donated \$500,000 to establish the Floyd and Helga Gottwald Marine Science Endowment



Sunrise in Gloucester Point.

that will support research on billfish and on water quality in Chesapeake Bay. The Moses D. Nunnally Charitable Trust pledged \$500,000 to create an endowment to support the VIMS Fish Collection, a vital scientific resource that is used by faculty and students at VIMS and around the nation and the world.

I especially want to thank our volunteer leadership for their devotion and advice—both visionary and practical. Carroll Owens, Jr. recently stepped down as president of the VIMS Foundation Board and we are most fortunate that he will remain on the Board. He has supported the Foundation's development in many ways, and as a William & Mary graduate has also fostered partnerships between VIMS and the College's main campus, notably through recent support for the new marine science minor for undergraduates. Carroll has been succeeded as president by A. Thomas Young, a long-time VIMS Council member and Board member with a distinguished career in business and space research. Pamela Faggert of Dominion and Ann Sullivan of Crenshaw, Ware & Martin, P.L.C. have also joined the Foundation Board.

Rick Amory, chair of the VIMS Council, continues to lead that distinguished group of business and community leaders. I thank the members who rotated off at the end of 2012 for their dedicated service: Thomas E. "Teddy" Gottwald, James Hixon, Pamela Faggert, James E. Rogers, and Case Whittemore.

I extend a warm welcome to the new members joining in fiscal 2013: Guy Chapman, William Galanko, James "Jeff" Jones, Ben Williams III, Pete Lalor, and the Honorable Harvey Morgan, recently retired from a distinguished career as a member of the Virginia House of Delegates. We look forward to working with all of them.

Finally, I thank all those who support VIMS in so many ways. We will continue to deliver the objective science that helps us understand our world, and to educate the next generation of scientists. The Commonwealth and our nation rely on them for the future understanding and health of our planet.

John T. Wells

John T. Wells



A ribbon-cutting ceremony for the Eastern Shore Laboratory Seawater Facility took place on June 23, 2012 at the VIMS Wachapreague campus. From L-R: John Wells, VIMS Dean & Director; Nicholas DiPasquale, Director of the Chesapeake Bay Program Office; Delegate Lynwood Lewis; Dennis Liberson, W&M Board of Visitors; Mark Luckenbach, ESL Director; Donna Phaneuf, founding principal of VIA design architects, pc; Michael Maul, Associate Director of the VA Dept. of Planning and Budget; and W&M President Taylor Reveley. Photo by Jay Paul.



Community and business leaders learned more about VIMS and its impact on the Bay and on marine issues nationally and globally during an event at NewMarket Corporation headquarters in Richmond. The event was hosted by NewMarket CEO and VIMS Council member Teddy Gottwald and a Host Committee of VIMS Council members including Marshall Acuff, Cynthia Bailey, Pamela Faggert, Waddy Garrett, Henry George, Morgan Massey, Travis Massey, Jack Nelson, Jim Rogers, Ann Samford, Gordon Smith, Vernon Spratley, and William Strickland.



Members of the VIMS Council provide guidance to the Institute during one of their quarterly meetings.



VIMS Council Chair Rick Amory addresses the crowd at the Maury Society dinner.



VIMS Council member Guy Chapman (C) and newly elected VIMS Foundation President Thomas Young (R) with Hampton University student Cedric Shamley at the dedication of the Eastern Shore Seawater Facility.



People and businesses around Chesapeake Bay followed Tidewatch forecasts during the passage of Superstorm Sandy. ©NOAA



Mark Patterson helped lead what might be the last mission to the *Aquarius* Undersea Laboratory. ©NOAA.



VIMS researchers studied oil slicks in the Ohmsett wave tank. ©Paul Panetta.

Scientific Impact

These selected news stories highlight the many ways in which VIMS researchers use financial support from state, federal, and private sources to help address the many challenges facing Chesapeake Bay, the coastal ocean, and human society.

Tidewatch forecasts go public

VIMS researchers added forecast capabilities to their network of Tidewatch water-level stations in 2012, giving Chesapeake Bay residents a new on-line tool for gauging the magnitude of coastal flooding and minimizing its impacts.

Emeritus Professor John Boon, lead developer of the Tidewatch system, says the forecasts provide concerned citizens with “timely guidance on what the time and height of the next three high waters are expected to be.” He adds “They can use that information to prepare for coastal flooding, whether that involves gathering sand bags, moving possessions to higher ground, adjusting mooring lines for their boat, or choosing an evacuation route.”

VIMS professor leads mission to underwater research station

VIMS Professor Mark Patterson teamed with National Geographic’s Explorer-in-Residence Sylvia Earle on what could be the last expedition to NOAA’s *Aquarius*, the world’s only underwater research station.

Their weeklong July mission—a celebration of 50 years of human habitation of the seafloor—focused on studies of nearby coral reefs. It was broadcast to educational facilities worldwide, including the Science Museum of Virginia and teams of students at VIMS and the Woods Hole Oceanographic Institution. Patterson and Earle also gave underwater interviews to ABC’s *Nightline*, NPR’s *Science Friday*, the *New York Times*, and the *Washington Post*.

The continued operation of *Aquarius* is under question due to federal plans to eliminate the \$4 million National Undersea Research Program under which the lab and several other undersea research programs operate.

Crab population hits 19-year high

Data from the 2011-12 Blue Crab Winter Dredge Survey—conducted annually by VIMS and the Maryland Department of Natural Resources—show that Chesapeake Bay’s blue crab population is booming, fueled by a large increase in juveniles.

Survey results show that the Bay’s blue crab population reached 764 million, due to 4 years of a baywide stock-rebuilding program. This is 66% above the 2011 level, and the highest level recorded since 1993. It is more than triple the record low of 249 million set in 2007, the year before the stock-rebuilding program began.

The survey sounded one cautionary note: an ~50% drop in spawning age females from 2011 levels. VIMS Professor Rom Lipcius says “The recorded number of spawning age females is a warning signal that requires a risk-averse, prudent management strategy to avert another decline.” Crab abundance had declined by 70% before the baywide stock-rebuilding program began in 2008.

Sound science may guide dispersant use during subsea oil spills

Preliminary results from a study by VIMS researchers Paul Panetta and Carl Friedrichs suggest that sound waves can help determine the size of oil droplets in the subsea. The effort is funded by the U.S. Department of the Interior and supported by the VIMS-Industry Partnership.

Chemical dispersants have conventionally been applied to surface oil slicks to protect the shoreline and marine life while speeding up bacterial decay. During the Deepwater Horizon oil spill, however, industry for the first time released dispersants directly into a deep-sea blowout. The idea was to keep oil from the surface and lower the amount of dispersants used, but the effectiveness and safety of this practice remains unknown, partly due to the difficulty of monitoring the size of oil droplets in the deep sea. The VIMS research suggests that acoustic techniques can help, giving spill responders a means to gauge the effectiveness of the dispersants and how much they should use during the cleanup of future spills as oil rigs move into increasingly deep water.

Diaz helps lead international study of ocean value

VIMS Professor Robert Diaz is a co-editor of “*Valuing the Ocean*,” a major new study by an international team of scientists and economists

that attempts to measure the ocean's monetary value and to tally the costs and savings associated with human decisions affecting ocean health.

The study estimates that if human impacts on the ocean continue unabated, declines in ocean health and services will cost the global economy \$428 billion per year by 2050, and \$1.98 trillion per year by 2100. Alternatively, steps to reduce these impacts could save more than a trillion dollars per year by 2100, reducing the cost of human impacts to \$612 billion.

Diaz says the study is unique in stressing the interactions between and among multiple threats, which include acidification, low-oxygen "dead zones," overfishing, pollution, sea-level rise, and warming.

The study's positive message is that local actions can make a global difference. The authors note, "Thanks to close links between globally and locally acting stressors, coordinated small-scale interventions can aggregate upwards to have major significance."

Partnership explores community-supported fishery

A partnership between Virginia Sea Grant and William & Mary—including VIMS, the Mason School of Business, and the Marshall-Wythe School of Law—is exploring whether a community-supported fishery is a feasible means to promote greater consumption of locally harvested fish and shellfish.

Project leader Troy Hartley, director of the Virginia Sea Grant program at VIMS, says "Community-supported fisheries connect fishermen directly to local markets. Consumers pay for a share of the fishermen's catch, and in return receive fresh seafood on a regular basis."

In addition to Hartley, the project team includes Business Professor Michael Luchs; VIMS graduate student Gar Secrist, head of the VIMS "Green Team;" and a team of law, MBA, and undergraduate students at W&M.

Eelgrass restoration aids overall recovery of coastal bays

The reintroduction of eelgrass into Virginia's coastal bays—a collaborative effort among VIMS, the University of Virginia, The Nature Conservancy, and the Virginia Coastal Zone Management Program—is one of the great success stories in the annals of marine restoration.

The 15-year restoration process, led by VIMS Professor Robert "JJ" Orth, has transformed the area from bare seafloor sediments to lush eelgrass meadows. This "state change" has led to a more vibrant ecosystem overall, with hopes for re-establishing bay scallops, which had supported a significant commercial fishery until the 1930s when a seagrass disease and a strong hurricane led to their demise.

Orth and his team began planting eelgrass into Virginia's coastal bays in 1997, a year after hearing an anecdotal report of a small patch in

South Bay. From 1999 through 2010, the team has collected and broadcast 37.8 million eelgrass seeds across 309 acres in 4 coastal bays. Those plantings have now expanded through natural re-seeding into 4,200 acres.

The effort has been funded by the grants from numerous state and federal agencies, as well as private grants from the Allied Signal Foundation, Inc., Norfolk Southern, and the Keith Campbell Foundation for the Environment.

Partnership engages disabled veterans in fly fishing

VIMS has partnered with the Fly Fishers of Virginia and Dominion Power to help rehabilitate disabled veterans through a unique program called Project Healing Waters.

Susanna Musick, head of the VIMS component of the Virginia Game Fish Tagging Program, supported the project by helping veterans tag and release their catch during three fly-fishing training events at the "Hot Ditch" near Dominion's Chesapeake Energy Center.

In addition to receiving training in fly casting, the veterans learned about the importance of catch-and-release fishing and helped contribute to the tagging program's goal of encouraging recreational anglers to enhance data-collection efforts for poorly studied species such as red drum, black drum, cobia, tautog, and speckled trout.



Wounded warrior Bill Green checks out his catch. ©Will Sweatt/VASG

Serving Virginia & the Nation

VIMS faculty and staff help inform policy solutions locally, nationally, and internationally, offering practical solutions for managing fisheries, improving water quality, and restoring marine habitats. Below is a sampling of the many forms of advisory service at VIMS.

Stan Allen established the ABC Industry Advisory Committee to guide the course of selective breeding for the oyster aquaculture industry, and serves as a visiting expert for the Australian Seafood Cooperative Research Centre.

Donna Bilkovic is an at-large appointee to the Chesapeake Bay Program's Scientific and Technical Advisory Committee and its Habitat Goal Implementation Team.

Carol Hopper Brill is grants chair and a member of the Conference Committee for the Mid-Atlantic Marine Education Association. She also serves as the VIMS representative to the Virginia Resource Use Education Council.

Deborah Bronk is on leave to head the Ocean Section of the Geosciences Directorate at the National Science Foundation.

Mark Brush is president of the Atlantic Estuarine Research Society and a member of the Governing Board and Education Committee for the Coastal and Estuarine Research Foundation and the technical review panel for the Long Island Sound Study.

Elizabeth Canuel serves as past-chair of the Geochemical Society's Organic Geochemistry Division and as Secretary of Marine Geochemistry for the American Geophysical Union's Ocean Sciences Division.

Ryan Carnegie attended the International Symposium on Aquatic Animal Health and Food Safety in Mexico, where he advised on aquaculture health management as related to cross-border trade in North America. This activity related to Carnegie's role as the World Organisation for Animal Health's (OIE) designated reference expert for *Perkinsosis* and *Haplosporidiosis*, shellfish diseases of global significance.

Grace Cartwright participated in her fifth QARTOD (Quality Assurance of Real-Time Observing Data) workshop. Sponsored by the National Data Buoy Center, it focused on ways to ensure quality data from dissolved-oxygen sensors.

Vicki Clark is an executive committee member and past chair of the National Sea Grant Education Network and a member of the National Sea Grant Program's Seafood Focus Team. She serves the National Marine Educators Association as chair of their Bylaws Committee, an advisor to the Executive Committee, and an editorial-board member for the NMEA journal *Current*. She also advises on seafood education as a member of the Virginia Chefs Association/American Culinary Federation.

Robert Diaz served the United Nations as a member of advisory panels for transboundary water research and a project to reduce nutrients and hypoxia. He was an invited participant at a workshop for information exchange with Pacific Island nations and the International Earth System Expert workshop on ocean stresses and impacts. He co-authored and edited *Valuing the Oceans*, and helped release the book during the Planet Under Pressure conference in London.

Emmett Duffy serves on the National Geographic Society's Committee for Research and Exploration, and is on the Editorial Board for *Ecology Letters* and the *Journal of Ethology*.

Mary Fabrizio manages VIMS' juvenile abundance surveys for fish and blue crabs in Chesapeake Bay and serves on the Atlantic Croaker Technical Committee of the Atlantic States Marine Fisheries Commission and the Board of Directors for the Hudson River Foundation.

Carl Friedrichs serves on the Chesapeake Community Modeling Program's Steering Committee, the Chesapeake Bay Program's Scientific & Technical Advisory Committee, and the Southeastern University Research Association's Coastal & Environmental Research Committee. He also chairs the Chesapeake Focused Research Group of the National Science Foundation's Community Surface Dynamics Modeling System, and serves on the Editorial Board of *Continental Shelf Research* and as an associate editor of *Estuaries and Coasts*.

Marjorie Friedrichs serves as an at-large member of the Chesapeake Bay Program's Scientific and Technical Advisory Committee and on its Modeling Laboratory Action Team. She also serves on the steering committee for the Chesapeake Community Modeling Program and the scientific steering group for the North American Carbon Program.

John Graves testified before the U.S. House of Representatives regarding the Billfish Conservation Act; the Pirate Fishing Vessel Disposal Act; and the Illegal, Unreported and Unregulated Fishing Enforcement Act. President Obama signed the Billfish Conservation Act in October. Graves also continues as chair to the U. S. Advisory Committee for ICCAT (International Commission for the Conservation of Atlantic Tunas).

Rob Hale serves on the editorial boards of the *Journal of Environmental Toxicology & Chemistry* and the *Journal of Residuals Science & Technology*.

Kirk Havens is one of two Governor's appointees to the Chesapeake Bay Program's Scientific and Technical Advisory Committee, where he serves as vice chair. He serves a similar appointment with the Albemarle-Pamlico National Estuary Program in North Carolina.

Carl Hershner is a member of the Chesapeake Bay TMDL advisory panel, and serves on the Chesapeake Bay Program's Goal Implementation Team. He provides technical support for the Commonwealth's wetlands and shoreline management programs and is on the Statewide Advisory Board for the Virginia Water Resources Research Center.

Eric Hilton serves as the Virginia representative to the Atlantic States Marine Fisheries Commission Shad and River Herring Technical Committee and is a member of the Board of Governors of the American Society of Ichthyologists and Herpetologists.

John Hoenig serves on the Science and Statistics committees of the New England and South Atlantic fishery management councils; and on the Tautog Technical Committee, the Striped Bass Tagging Subcommittee, and the Interstate Tagging Committee of the Atlantic States Marine Fisheries Commission. He also serves on the Chesapeake Bay Stock Assessment Committee for the National Marine Fisheries Service's Chesapeake Bay Office.

Lisa Lawrence is president of the Mid-Atlantic Marine Education Association, technology committee chair for the National Marine Educators Association, and serves on NOAA's Education Website Advisory Committee. She is also an editorial-board member for the NMEA journal *Current*.

Rob Latour is a member of the Menhaden Technical Committee and the Multispecies Subcommittee of the Atlantic States Marine Fisheries Commission. He is also a member of the Scientific and Statistical Committee for the Mid-Atlantic Fishery Management Council and an associate editor for *Estuaries and Coasts*.

Rom Lipcius serves on the Chesapeake Bay Stock Assessment Committee for blue crabs, and chaired an ICES workshop in Denmark on the Value of Coastal Habitats for Exploited Species. The workshop report will be used to help model and manage fisheries in the Atlantic and Mediterranean.

Mark Luckenbach is a member of the Chesapeake Bay Program's Scientific and Technical Advisory Committee, the Maryland Coastal Bays' Scientific and Technical Advisory Committee, and the Maryland Oyster Commission. He also serves on the TMDL Implementation Committee for Virginia's Department of Environmental Quality and Department of Conservation and Recreation.

Sarah McGuire was chosen as president-elect for the Mid-Atlantic Marine Education Association.

Roger Mann served on Virginia's Invasive Species Council and the Governor's Advisory Board on Aquaculture, and contributed as an

invited expert to the International Workshop on Shellfish Stock Assessments and to the working group for New Jersey's Oyster Stock Assessment and Management Plan. He is a member of the Mid-Atlantic Fishery Management Council's Invertebrate Stock Assessment Working Group, the Federal Interstate Shellfish Transport Advisory Committee, the Ballast Water Research Committee of the Aquatic Nuisance Species Task Force, and the Mid-Atlantic Panel on Aquatic Invasive Species. He continues to serve on the editorial boards of *Aquaculture* and the *Journal of Shellfish Research*.

Ken Moore and **Kim Reece** were appointed to three-year terms on the Science Advisory Panel for the James River Chlorophyll Study, part of the effort to implement "Total Maximum Daily Loads" in Chesapeake Bay. The panel provides advice on developing improved chlorophyll standards for the James River, especially as they relate to harmful algal blooms.

Tom Murray served as a member of the Virginia Aquaculture Advisory Committee, the National Proposal Review Committee for the U.S. Fish and Wildlife Service's Boating Infrastructure Grants program, the Tidewater Resource Conservation and Development Council, and the Mathews County Put-In Creek Committee. He was also on the Conference Organizing Committee for the Working Waterways & Waterfronts National Symposium on Water Access.

Susanna Musick serves on the Black Drum Technical Committee and Tagging Subcommittee for the Atlantic States Marine Fisheries Commission.

Robert Orth serves on the Chesapeake Bay Program's workgroup on submerged aquatic vegetation (SAV) and gave his annual presentation on the status of SAV in the Chesapeake region to the Virginia Marine Resource Commission.

Mark Patterson was elected to a three-year term on the Board of Directors of the Association of Unmanned Vehicle Systems International.

Kim Reece and **Wolf Vogelbein** serve on Virginia's Harmful Algal Bloom Task Force.

Rochelle Seitz serves as review editor for the *ICES Journal of Marine Science* and participated in an international workshop on the Value of Coastal Habitats for Exploited Species.

Jian Shen completed six advisory reports on "Total Maximum Daily Loads" for the Virginia Department of Environmental Quality, and two TMDL reports for the Maryland Department of the Environment.

Jeff Shields is a member of the Editorial Board for the *Journal of Invertebrate Pathology*.

Walker Smith is editor of *Antarctic Science* and a member of the Scientific Steering Committee for the National Science Foundation's Ocean Carbon and Biogeochemistry Initiative.

Deborah Steinberg continues as a council member for the University-National Oceanographic Laboratory System (UNOLS) and The Oceanography Society, a trustee of the Bermuda Institute of Ocean Science, and an associate editor for *Deep-Sea Research*.

Nancy Stokes was the invited keynote speaker for an oyster industry restoration workshop in Nova Scotia, where she spoke on "Increased Virulence and Declining Impact of an Introduced Pathogen: *Haplosporidium nelsoni* in Chesapeake Bay Oysters."

Kam Tang is a member of the American Society of Limnology and Oceanography's Diversity Committee, a critical stakeholder reviewer for the Next Generation Science Standards, and a membership-application reviewer for Sigma Xi.

Troy Tuckey serves on the Fisheries Ecosystem Workgroup for NOAA's Chesapeake Bay Office.

Mike Unger was re-elected to a three-year term on the Board of Directors for the Elizabeth River Project.

John Wells served on the Science Board for the Louisiana Coastal Protection and Restoration Program and continues to serve as Editor-in-Chief of *Marine Geology*.

Awards and Recognition

Faculty

Stan Allen was named the Laborde Endowed Chair for Sea Grant Research and Technology Transfer by the Louisiana Sea Grant College Program. His appointment runs through June 2013.

Iris Anderson, Courtney Harris, and Roger Mann were among 20 exceptional William & Mary faculty members receiving prestigious Plumeri Awards for Faculty Excellence in 2012. The awards, now in their fourth year, recognize faculty members' exemplary achievements in teaching, research, and service.

Robert Diaz was elected to a three-year term as vice chair of a federal advisory committee to the federal Bureau of Ocean Energy Management. BOEM—part of the reorganization of the former Minerals Management Service following the Deepwater Horizon oil spill—is tasked with managing the exploration and development of petroleum and renewable resources in the nation's offshore waters.

Troy Hartley was appointed to a federal committee that will evaluate the effectiveness of fisheries management nationwide. Formed at the request of Congress by the National Research Council, the *Committee on Evaluating the Effectiveness of Stock Rebuilding Plans* will review efforts to rebuild domestic and international fish stocks and advise Congress on best practices for future efforts.

John Milliman received one of Virginia's three Outstanding Scientist awards from Governor McDonnell in 2012 for his work on river sediments and their chemical signatures. The award recognizes Milliman for his international renown in the field of sedimentary geology, based on his groundbreaking studies of sediment transport, deposition, and diagenesis, and of river discharge to the ocean. Milliman's research has spanned several continents to reveal the impact of climatic and human influences on rivers around the world.

Deborah Steinberg was chosen by the American Geophysical Union to deliver the Sverdrup Lecture during the annual meeting of its Ocean Sciences section. The Lecture is one of the highest awards the Section bestows on its members. Steinberg was recognized for her leadership in research aimed at understanding the role of biological processes in the ocean's mid-water "twilight zone" and their influence on carbon and nitrogen cycles in the ocean.

Staff

Carol Hopper Brill received the Informal Educator Award from the Mid-Atlantic Marine Education Association. The award recognizes contributions to education in settings such as museums, aquaria, zoos, science centers, or a government agency.

Tom Grose and **Mark Rogers** represented VIMS in accepting a Diamond Excellence award from the Hampton Roads Sanitation District in recognition of exemplary management of wastewater on VIMS' 40-acre shoreline campus in Gloucester Point. VIMS was recognized for 12 consecutive years of perfect compliance with its wastewater permit.

Graduate registrar **Sue Presson** was recognized during the VIMS Awards Ceremony and Employee Appreciation Day at William & Mary for her 50 years of service to VIMS, the College, and the Commonwealth.

VIMS Service Awards

Facilities/Safety/Trades

Mr. Raymond Forrest

Research/Advisory Service

Mr. Scott Marion

Technical Support

Ms. Rita Crockett

Administrative Support

Ms. Cindy Hornsby

Outstanding Professionals Award

Mr. Mark LaGuardia

Outstanding Faculty Research Award

Dr. Robert "JJ" Orth

Freeman Volunteer of the Year Award

Ms. Joana Blum and Mr. Bill Walsh



Chancellor Professor John Milliman.
©Rowan Lockwood.



Professor Deborah Steinberg in Antarctica.



Mrs. Sue Presson, with VIMS Dean and Director John Wells, was recognized for 50 years of service.

Grants and Contracts

VIMS researchers earned 141 grants and contracts during fiscal year 2011-2012, for a total of \$16,191,290 in federal, state, and private funding. In addition to supporting critical research and advisory activities within the Commonwealth, this funding provided opportunities to enhance educational programs and conduct cutting-edge research nationally and internationally. Highlights include:

Stan Allen and Anu Frank-Lawale, "Improving shellfish survival through genetic improvement in disease resistance," US Department of Agriculture, \$34,076

Iris Anderson, Mark Brush, and Mark Luckenbach, "Developing strategies to sustain hard clam aquaculture while minimizing impacts on water quality and nutrient dynamics," National Oceanic and Atmospheric Administration, \$69,976

Deborah Bronk and Rachel Sipler, "Effluent organic nitrogen produced within wastewater treatment plants," Water Environment Research Foundation, \$116,234

Robert Diaz, "The effects of the Macondo Oil Spill on coastal ecosystems," Gulf of Mexico Research Initiative, \$72,350

Mary Fabrizio and Troy Tuckey, "Estimating relative juvenile abundance of important finfishes in the Virginia portion of Chesapeake Bay," US Department of the Interior Fish and Wildlife Service, \$417,539

Mary Fabrizio, Troy Tuckey, and Rob Latour, "Estimating population size and survival rates of blue catfish in Chesapeake Bay tributaries," National Oceanic and Atmospheric Administration, \$376,482

Carl Friedrichs, "Simple parameterized models for predicting mobility, burial and re-exposure of underwater munitions," US Department of the Army, \$84,700

Troy Hartley, "Community adaptation to sea-level rise," National Oceanic and Atmospheric Administration, \$134,994

Carl Hershner and Kirk Havens, "Refinement of wetland monitoring and assessment strategy for Virginia," Environmental Protection Agency, \$514,303

John Hoenig, "Evaluation of striped bass stocks in Virginia: tagging and monitoring studies," US Department of the Interior, \$423,571

Howard Kator and Kimberly Reece, "Study of adenovirus and its infectivity in wastewater treatment plant effluent," National Oceanic and Atmospheric Administration, \$30,528

Rob Latour and Andre Buchheister, "Food web structure in Chesapeake Bay and environmental effects on fish diets: supporting ecosystem-based approaches to fisheries management," National Oceanic and Atmospheric Administration, \$41,988

Pamela Mason, "Identification of options and approaches to establishment of a Living Shorelines General Permit in Virginia," National Oceanic and Atmospheric Administration, \$30,000

Thomas Murray, "Developing a working waterfronts plan for Virginia's coastal zone," National Oceanic and Atmospheric Administration, \$50,000

Susanna Musick and Thomas Murray, "Virginia Game Fish Tagging Program Year 18 Proposal (2012)," Virginia Marine Resources Commission, \$42,475

Michael Newman, "Mercury exposure modeling and risk/benefit communication to lower Chesapeake Bay fish consumers," National Oceanic and Atmospheric Administration, \$27,968

Robert Orth, "2012 SAV Distribution and Abundance Survey," Environmental Protection Agency, \$240,000

Mark Patterson, "RAPID: Underwater robotics applied to STEM education: A time-sensitive discovery in marine archeology," National Science Foundation, \$199,927

Jim Perry, "Plant identification classes for Virginia Department of Transportation," Virginia Department of Transportation, \$63,031

David Rudders, "An assessment of sea scallop abundance and distribution in selected areas: the Hudson Canyon and DelMarVa Closed Areas and inshore areas of the New York Bight," National Oceanic and Atmospheric Administration, \$678,016

Walker Smith, "Impact of mesoscale processes on iron supply and phytoplankton dynamics in the Ross Sea," National Science Foundation, \$365,203

Harry Wang, "Modeling flood inundation under storm surge and precipitation in NASA Langley Research Center," National Aeronautics and Space Administration, \$25,000

Michael Unger, Wolfgang Vogelbein, and Stephen Kaattari, "A real-time antibody-based field assay to predict contaminant bioavailability in sediments," National Institutes of Health, \$276,184

Wolfgang Vogelbein, Mary Fabrizio, and Richard Brill, "Physiological responses and tolerances of healthy and mycobacteriosis-infected striped bass to decreased dissolved oxygen levels," National Oceanic and Atmospheric Administration, \$39,952



VIMS researchers Mike Unger, Wolfgang Vogelbein, and Steve Kaattari with their biosensor.



Eighteen students arrived at VIMS in August 2012 to begin their pursuit of a Master's or Ph.D. degree.



Jon Loftis (R) receives his award during the Oceans12 Conference.



Candace Spier operates the computer that controls the biosensor during field tests on the Elizabeth River. ©Mike Unger.



Professor Mark Brush (R) and graduate student Sam Lake(L) worked with Virginia teachers as part of a NASA program to expand the use of modeling and simulation in high-school classrooms.

School of Marine Science

Graduate students in the School of Marine Science at VIMS have an unparalleled opportunity to conduct research that benefits society, with many pursuing studies that involve collaborations with industry and management agencies at the state, regional, and international levels. Here are highlights of accomplishments by some of our more than 100 currently enrolled students. A full list of recent theses and dissertations is available at vims.edu/library.

External Student Awards

Andre Buchheister received a third annual scholarship from the International Women's Fishing Association. IWFA scholarships support marine science graduate students as a way of promoting conservation of fisheries resources.

Jon Loftis took one of three third-place awards in the Student Poster section at the Oceans12 Conference for his "Simulation of Coastal Inundation Instigated by Storm Surge, River Discharge, and Precipitation in the Chesapeake Bay Using Sub-grid Modeling with LiDAR Digital Elevation Models."

Anna Murphy, Ryan Schloesser, Mark Stratton, and Xiaoyu Xu were awarded two-year fellowships from Virginia Sea Grant in support of their coastal and marine research. The fellowships emphasize communication skills to ensure that research results are used by stakeholders.

Alison O'Connor received a Graduate Research Fellowship from the National Science Foundation.

Lori Sutter earned a STAR Fellowship from the U.S. Environmental Protection Agency.

Yongjin Xiao won the Best Student Presentation Award and the Best Group Presentation Award at the Marine Ecosystem Evolution in a Changing Environment Summer School in Ankara, Turkey.

Best Student Papers

Master's

Patrick Dickhudt, Carl Friedrichs, and Lawrence Sanford. 2011. Mud matrix solids fraction and bed erodibility in the York River estuary, USA, and other muddy environments. *Continental Shelf Research*.

Ph.D.

Robert Condon, Deborah Steinberg, Paul del Giorgio, Thierry Bouvier, Deborah Bronk, Monty Graham, and Hugh Ducklow. 2011. Jellyfish blooms result in a major microbial respiratory sink of carbon in marine systems. *Proceedings of the National Academy of Sciences*.

Highlights

Tests show biosensor can guide clean ups

Ph.D. student Candace Spier reported on field tests of a new antibody-based "biosensor," showing that it can detect marine pollutants like oil much faster and more cheaply than current technologies. The device is small and sturdy enough to be used from a boat.

Testing of the biosensor shows that it can process samples in less than 10 minutes, detect pollutants at levels as low as just a few parts per billion, and do so at a cost of just pennies per sample. Current technology requires hours of lab work, with a per-sample cost of up to \$1,000.

The tests were part of an on-going biosensor research and development program led by VIMS Professors Mike Unger and Steve Kaattari, with contributions from Spier and marine scientist George Vadas. The instrument was developed in conjunction with Sapidyne Instruments, Inc., with funding from the state of Virginia, the Office of Naval Research, and a partnership between NOAA and the University of New Hampshire.

Study reveals small fish can play a big role in coastal carbon cycle

A study by Dr. Grace Saba shows that small forage fish like anchovies can play an important role in the "biological pump," the process by which marine life transports carbon dioxide from the atmosphere and surface ocean into the deep sea—where it contributes nothing to current global warming.

The study was published in *Scientific Reports*, a new online journal from the Nature Publishing Group. It reports on data collected on an oceanographic expedition to the California coast during Saba's Ph.D. studies at VIMS. Saba is now a post-doctoral researcher in Rutgers' Institute of Marine and Coastal Sciences.

VA Education Secretary visits VIMS

Virginia Education Secretary Laura Fornash learned more about VIMS' academic and outreach programs during a visit to Gloucester Point that included a trip aboard a research vessel to the nearby Goodwin Islands, one example of the many non-traditional "classrooms" used for teaching and research at VIMS.

Fornash and Deputy Education Secretary Javaid Siddiqi learned about VIMS' many educational programs during offshore and onshore discussions with VIMS Dean and Director John Wells, Associate Dean of Academic Studies Linda Schaffner, Chief Financial & Administrative Officer Jennifer Latour, CBNERRVA Director William Reay, and a number of staff and students.

Fornash said "We really enjoyed our visit with the administrators and the students. They're doing great things for the Commonwealth with their research and educational programs, and I especially enjoyed hearing how they're engaging young minds in the field of marine science."

Alumni continue service on Capitol Hill

Theresa Davenport and Gabrielle Saluta were honored with Knauss Marine Policy Fellowships for 2013, continuing a long tradition of VIMS graduate students earning these prestigious fellowships through the National Sea Grant Federal Fellows Program.

Davenport will serve as an analyst in NOAA's Office of Policy, Planning, and Evaluation, where she will monitor emerging science and policy issues and help develop a 5-year strategic plan for research and development.

Saluta will serve as a Legislative Fellow for U.S. Representative Madeleine Bordallo of Guam, assisting with a variety of environmental and fisheries issues by preparing for and attending committee meetings and hearings, tracking relevant legislation, helping to draft legislation, and meeting with constituents.

Of the 67 students from institutes of higher education in Virginia who have served as Knauss fellows since the program began in 1979, 41 (61%) have hailed from William & Mary's School of Marine Science at VIMS.

REU program enjoys another successful year

The Research Experience for Undergraduate (REU) program entered its 23rd year at VIMS, with 12 students from colleges and universities around the nation enjoying 10 weeks of hands-on field and laboratory experience in coastal marine science.

The program is funded by the National Science Foundation and managed by Associate Dean of Academic Studies Linda Schaffner and Research Associate Professor Rochelle Seitz. VIMS faculty and graduate students mentor the students during their stay.

Schaffner notes that the REU program serves as an excellent "feeder" program for the graduate program at VIMS and provides a valuable opportunity for undergraduates in W&M's new marine science minor.

VIMS celebrates Earth Day with garden

VIMS established an on-campus vegetable garden in 2012, the latest effort by faculty, staff, and students to make the Institute's facilities and operations more sustainable and environmentally friendly.

The effort was spearheaded by graduate students Jenna Luek and Brandon Conroy, along with faculty mentor John Graves. Start-up of the VIMS Community Garden was funded by a \$2,400 grant from William & Mary's Committee on Sustainability. Established in 2008, the committee uses funds from the Student Green Fee to promote sustainable practices throughout W&M and nearby communities. In addition to creating a community garden, the VIMS project also introduced a composting program to the Gloucester Point campus and added several rain barrels to collect water for irrigation.



Virginia Education Secretary Laura Fornash (3rd from R) and Deputy Secretary Javaid Siddiqi (3rd from L) with VIMS administrators and staff during their trip to the Goodwin Islands.



Students in the Research Experiences for Undergraduates (REU) program at VIMS pose questions to Mark Patterson and Sylvia Earle during a live video teleconference from the *Aquarius* Underwater Lab.



Members of the VIMS Community Garden move topsoil into their raised beds. From L: Scott Marion, Kate Ruck, Sarah Glaser, Julia Moriarty, Carissa Wilkerson, and Blaine Schoolfield. ©Hadley McIntosh.



Erin Forgit, a 9th grader, won the Artwork Contest for Marine Science Day 2012.



The January After Hours Lecture on earthquakes drew a large crowd.



VIMS Professor Mark Patterson explores robotic subs during the January Discovery Lab.



CBNERR Education Coordinator Sarah McGuire with students from Grace Episcopal School in Alexandria.

Outreach

VIMS' outreach programs reached more than 10,000 individuals through events designed to inform and engage the public, marine industry workers, policymakers, and other stakeholders. A new focus was to expand offerings from labs and campus grounds to local beaches, parks, and waterways. We also reached nearly 4,500 subscribers through our monthly e-Tidings newsletter, added almost 500 new friends on Facebook, and engaged with more than 400 followers on Twitter.

Marine Science Day

Our flagship outreach event drew more than 2,000 people to Gloucester Point on May 19 to enjoy a behind-the-scenes look at how VIMS research and education helps empower Virginians to protect and restore Chesapeake Bay and the coastal ocean.

After Hours Lectures

Jamestown and the "Starving Time"

(March 29, 2012) W&M geologist Greg Hancock described his research into the role that bad drinking water may have played in the "Starving Time" of 1609-1610, when nearly half the Jamestown colonists perished.

Mycobacteriosis

(February 23, 2012) VIMS Professor Wolfgang Vogelbein described his team's studies of a chronic bacterial disease that infects more than half of all striped bass in Chesapeake Bay.

Earthquakes in Virginia

(January 26, 2012) W&M Geology Professor Chuck Bailey explored the nature, history, and probability of earthquakes in Virginia, with a focus on the magnitude 5.8 temblor that struck Virginia in 2011.

Secrets of the Seafloor

(October 27, 2011) VIMS Professor Steve Kuehl revealed the stories hidden in seafloor sediments cored from Chesapeake Bay and from sites as distant as New Zealand.

Harmful algal blooms in Chesapeake Bay

(September 29, 2011) VIMS Professor Kim Reece, a member of Virginia's Harmful Algal Bloom Task Force, explored the human activities and natural factors that encourage microscopic algae to form dense blooms, and the effects that some of these blooms can have on marine life and human health.

Underwater Grasses: Chesapeake Bay's under-appreciated habitat

(August 25, 2011) VIMS Professor Ken Moore discussed the life history of underwater grasses, explained

current and future threats, and offered tips for what citizens can do to help seagrasses recover and thrive.

Oyster Aquaculture in the Bay

(July 28, 2011) VIMS Professor Stan Allen explored the factors that are fueling the transition from wild harvest to aquaculture of oysters in Chesapeake Bay.

Discovery Labs

Ocean Chemistry and Acidification

(June 19, 2012) VIMS graduate student Hadley McIntosh explored how an increase in ocean acidity due to climate change can affect marine life. The lab included hands-on displays, demonstrations, and water testing.

Oysters

(April 17, 2012) VIMS researcher Anu Frank-Lawale and students from the Williamsburg Montessori Middle School explored oysters and oyster research at VIMS. Participants learned about these shellfish via microscopes, dissection, and displays.

Corals

(March 20, 2012) VIMS graduate student Jennifer Elliott shared her knowledge of coral-reef ecology while giving participants the opportunity to view corals through the microscope and make coral crafts.

Stories from the SWaMP

(February 21, 2012) William Reay, head of the Chesapeake Bay National Estuarine Research Reserve program at VIMS, discussed "SWaMP"—the program used to monitor water quality across all 28 sites within the National Estuarine Research Reserve system.

Underwater Robots

(January 17, 2012) VIMS Professor Mark Patterson showed off *Fetch*, a robotic sub he designed and has used for research around the world. Participants also got a chance to maneuver *Sea Perch*, a mini ROV (remotely operated vehicle).

Holiday Edition

Participants made marine-themed crafts and designed their own wrapping paper for the holiday season.

Mad Lab: Creepy, Crazy and Cryptic!

(October 18, 2011) Costumed guests learned about the wonders of science during this Halloween-themed lab by making slime and Insta-worms, writing with invisible ink, and playing with Boo Bubbles.

Ghosts in the Bay

(August 23, 2011) VIMS researcher Kirk Havens described a partnership with local watermen to find and remove abandoned or “ghost” crab pots from Chesapeake Bay.

Underwater Music

(July 19, 2011) VIMS graduate student Alison Deary explored how fish and shrimp produce sounds to interact with their own and other species in Chesapeake Bay.

Other On-Campus Events

Guided campus tours, lectures, summer camps, and workshops gave more than 1,444 adults and older children a close-up look at research and education at VIMS. Tours typically included a visit to the VIMS Visitor's Center and Aquarium, a research laboratory, the Fisheries Collection, and the Teaching Marsh.

Off-Campus Events

Outreach staff at VIMS charted a new course during summer 2012, expanding their educational offerings from labs and campus grounds to local beaches, parks, and waterways.

New off-campus activities include “VIMS at the Beach” and “Sharks in the Park,” as well as a hybrid on-campus/off-campus program called “Inside to Seaside.” Despite a warm, stormy summer, the programs proved popular among both local residents and tourists—with 28 off-campus sessions helping hundreds of people better understand Chesapeake Bay, its marine life, and the steps they can take to help protect and restore Bay waters.

Our traditional visits to civic groups, schools, and local festivals and fairs also continued to be popular. Faculty, staff, and students presented 35 invited talks to more than 1,500 citizens at community organizations throughout Tidewater Virginia via our Speaker's Bureau, and interacted with more than 1,700 people from VIMS-sponsored booths at the Urbanna Oyster Festival, Hampton Bay Days, Gloucester Daffodil Festival, and 14 other festivals and fairs in Hampton Roads and the Northern Neck.

VIMS also continued its unique partnership with Yorktown Sailing Charters LLC and their 105-foot schooner *Alliance*, offering 5 spring-time cruises on the York River during which guest scientists from VIMS shared knowledge on oyster aquaculture, Native American fishing techniques, jellyfish, derelict or “ghost” crab pots, and robotic subs.



From L: Kingsmill Executive Chef Peter Pakh discusses local seafood choices with First Lady Maureen McDonnell, VIMS researcher Kory Angstadt, Mrs. Renee Smith, and former First Lady Susan Allen during the “Healthy Bay for Healthy Kids” cooking event held at VIMS.



Local second graders prepare a Virginia blue crab salad during the “Healthy Bay for Healthy Kids” event at VIMS.



Three young visitors enjoy the new “Inside to Seaside” program.



VIMS Professor Deborah Steinberg at Magruder Elementary School's Career Day.



Outreach educator Kattie McMillan (R) and volunteer Diane Richman (L) offer a “VIMS at the Beach” session along the York River in Yorktown.

Faculty Books



Hobbs, Carl H. The Beach Book: Science of the Shore. New York: Columbia University Press 2012.



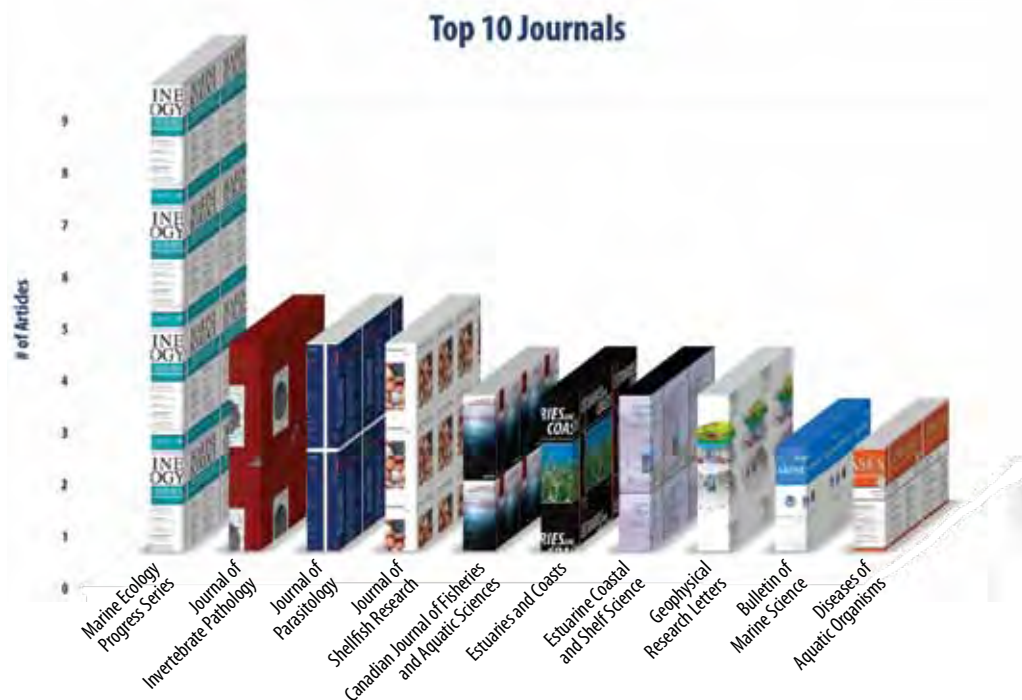
Carrier, J.C., **John A. Musick**, and M.R. Heithaus. Biology of Sharks and Their Relatives. 2nd ed. Boca Raton: CRC Press/Taylor & Francis Group, 2012.



Zuber, S. L., and **Michael C. Newman**. Mercury Pollution: A Transdisciplinary Treatment. Boca Raton, FL: CRC Press, 2012.

Publications

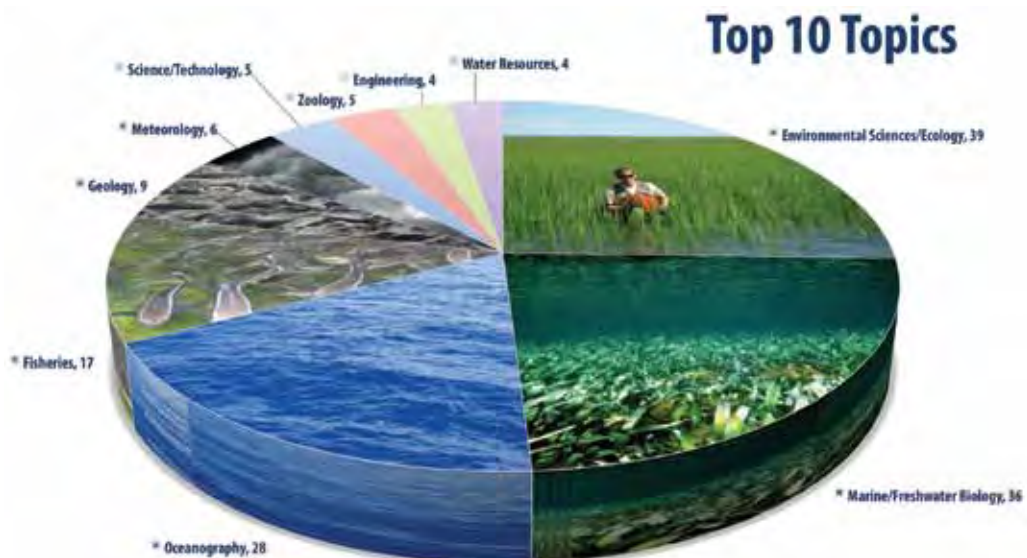
VIMS researchers published 95 peer-reviewed research articles and 11 review papers in 2012. Here's a quantitative and qualitative snapshot of these and other VIMS publications. All information is taken from Thomson Reuters Web of Science®. A full list of VIMS-authored journal articles is available at vims.edu/library.



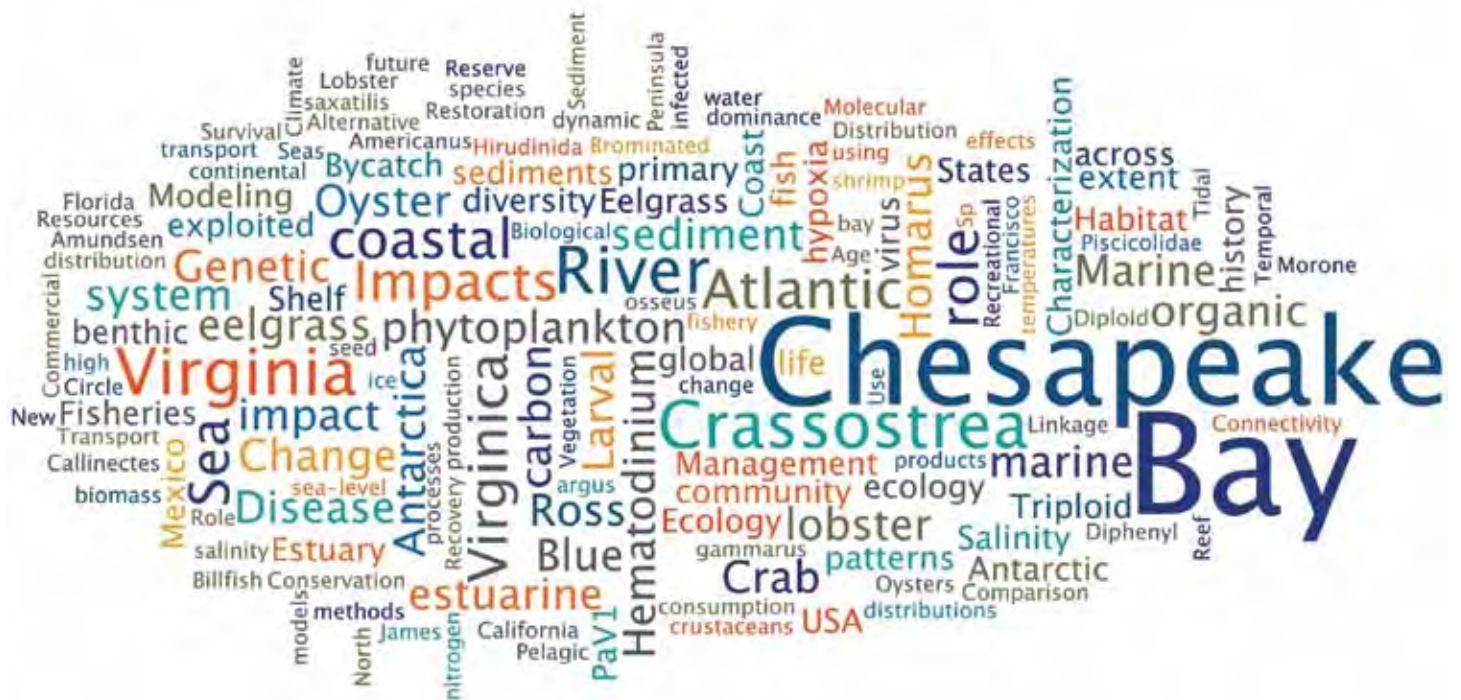
Most Cited Article

Waycott M., C. M. Duarte, T. J. B. Carruthers, **R. J. Orth**, W. C. Dennison, S. Olyarnik, A. Calladine, J. W. Fourqurean, K. L. Heck Jr., A. R. Hughes, G. A. Kendrick, W. J. Kenworthy, F. T. Short, and S. L. Williams. 2009. Accelerating loss of seagrasses across the globe threatens coastal ecosystems. Proceedings of the National Academy of Sciences of the United States of America 106:12377-12381.

Times Cited: 240



| Country | Percentage |
|-----------|------------|
| England | 16% |
| Australia | 13% |
| Canada | 13% |
| France | 11% |
| China | 11% |
| Germany | 9% |
| Sweden | 9% |
| Brazil | 7% |
| Portugal | 7% |
| Belgium | 4% |



2012 ANNUAL REPORT | 13

Giving Highlights

While we can only highlight a few gifts here, we deeply appreciate the support of the many friends, alumni, foundations, and corporations listed on our donor-recognition pages. All are advancing our important scientific work for Virginia and the nation. VIMS receives gifts directly as well as through the VIMS Foundation, with private philanthropy accounting for a growing percentage of our total support. For FY2012, VIMS received \$1,826,238 in private support from 2,332 donors. Of this, \$1,503,920 came through the VIMS Foundation. As of June 30, 2012, the VIMS Foundation held \$9,431,090 in assets and 36 separate endowments in support of fellowships, professorships, and programs. Endowed funds in the VIMS Foundation are invested with the William and Mary Investment Trust (WAMIT), a vehicle that is open to participation by foundations affiliated with the College of William and Mary, of which VIMS is a part. A summary of WAMIT's performance is included in this report.

Kauffman family leaves legacy for VIMS and the Bay

VIMS lost a great friend in 2012 when John Phillip Derr Kauffman died at age 92 at his home in Darien, Connecticut. Known as "Jack," Kauffman had a second home for many years in Topping, Virginia, and showed a deep passion for Chesapeake Bay.

Jack and his wife Ann "Boots" Kauffman had a vision: to see their Topping estate devoted to the health and welfare of the Chesapeake, with a focus on the Bay's iconic oyster. They envisioned their pastoral setting at the edge of Locklies Creek as another campus of VIMS, and that vision was fulfilled in 2004 when the Kauffman Aquaculture Center—the result of a challenge gift from Jack—opened as an essential component of VIMS' Aquaculture Genetics and Breeding Technology Center (ABC). The Kauffmans continued to generously support VIMS' oyster and aquaculture work even after the Center was built.

Originally constructed as a quarantine facility for non-native oysters, the Center now houses another type of non-native—the tetraploid oyster—and serves as a hub for refining the cutting-edge technology needed for tetraploid development. The tetraploid oyster is one of several genetic strains developed at ABC to "domesticate" the wild oyster and improve it for cultivation through oyster farming. Oyster aquaculture has seen extraordinary growth over the last decade in Virginia, from 1 million seeds to 50 million seeds per year. More than 90% of that production comes from oysters developed at the Center and shared with industry.

ABC Director Stan Allen says "We all miss Jack, but realize that the Kauffmans' legacy will continue to provide a setting for cutting-edge research and education that impacts the Bay for years to come."

The Kauffmans' legacy will be further augmented in future years through a charitable life estate that they established with their property in Topping for the benefit of VIMS.

Nunnally Endowment funds research at VIMS and globally

The Moses D. Nunnally Charitable Lead Trust has generously given \$500,000 to the VIMS Foundation to endow the Nunnally Ichthyology Collection. The collection—which contains nearly 140,000 specimens of fish and other marine life—is a vital scientific resource that is used by faculty and students at VIMS as well as by researchers from around the nation and world.

"The endowment has already helped us catalogue, identify, and maintain a large amount of the collection, which is very important in offering accessibility to the specimens we have here," says curator and Associate Professor Eric Hilton.

VIMS Ph.D. student Alison Deary, winner of the John E. Olney, Sr. Ichthyology Award, says the endowment has enabled her and other VIMS students to access fish of many different sizes—allowing her to supplement the sizes she collects in the field.

"The uniqueness of the specimens we preserve makes the collection of global importance, but our assemblage of Chesapeake Bay fishes is one of



From L: W&M President Timothy Sullivan joins Mr. John P.D. Kauffman and Mrs. Ann Kauffman, VIMS Dean and Director L. Donelson Wright, Mr. James E. Rogers, and Virginia Secretary of Natural Resources W. Tayloe Murphy, Jr., as they break ground for the Kauffman Aquaculture Center in May 2002.



The Kauffman Aquaculture Center.



Eric Hilton in the Nunnally Ichthyology Collection at VIMS.

our particular strengths because of the unique geographic area in which they are caught," says Hilton. The Collection also includes one of the nation's largest assemblages of deep-sea fishes.

Gottwald gift supports studies of billfish and water quality

The Herndon Foundation, a Gottwald family foundation, has donated \$500,000 to establish the Floyd D. Gottwald, Jr. and Helga Gottwald Marine Science Endowment at VIMS. The endowment will support research on billfish and on water quality in Chesapeake Bay, two areas of special interest to Mr. and Mrs. Gottwald.

The gift will help Professor John Graves, students, and colleagues in VIMS' Billfish Program continue their internationally recognized efforts to conserve and manage marlins, sailfish, and spearfish. Their genetic studies have already given new insights into the evolutionary relationships of different billfish species, and fundamentally altered our understanding of billfish stock structure. Their novel use of pop-up satellite tags to track the fate of fish released from commercial and recreational fishing gear has resulted in an Atlantic-wide measure requiring live release of white and blue marlin taken on pelagic long-line gear, and a national measure requiring the use of circle hooks in the recreational fishery.

The gift will also support numerous investigations of Bay water quality by VIMS professors, from field and modeling studies of nutrient cycling by Ken Moore, Mark Brush, and Iris Anderson, to Bob Diaz's internationally known work on low-oxygen "dead zones" and Robert Orth's work on seagrasses, a vital habitat for fish and shellfish in the Chesapeake and other coastal ecosystems around the world.

Dean and Director John Wells says, "As a scientist himself, Floyd Gottwald has long supported VIMS and understands that the science done here underpins our ability to identify and address the challenges facing the Bay. Helga brings tremendous energy to her interest in the health of the environment. We're grateful to both of them for supporting important directions in future research."

Mr. Gottwald adds, "VIMS is a treasure for the Commonwealth and the world and is unique in its advisory role to our state government. Every angler, indeed every Virginian, is ultimately affected by VIMS research, as it impacts our environment, our economy, and both our

commercial and recreational fisheries. We are pleased to help assure that VIMS will continue to be a leader in marine science."

Private giving advances research and education at Eastern Shore Lab

Interns from Virginia's Eastern Shore had the opportunity to pursue marine research close to home this summer at the VIMS Eastern Shore Laboratory (ESL) in Wachapreague.

The intern program is entirely funded by private donations. Private donors are Marsha and Rick Amory, Cynthia Bailey, Chris and Kirkie Bosworth, Barbara and Steve Johnsen, the E. Polk Kellam Foundation, E. Polk Kellam, Jr. and Roberta Kellam, Caramine Kellam, Debbie and Peter Lalor, Page and Tom Young, H.M. Terry Company, Inc., J.C. Walker Brothers, Inc., and Dr. Lucy Spigel Herman.

The ESL will also benefit from the support of two endowments—the Owens Family Foundation Education Endowment and the new VIMS Eastern Shore Laboratory Endowment for Research and Education. The latter has been created as a \$100,000 challenge grant from an anonymous donor. VIMS is raising funds to meet the challenge.

Private donor supports research and aquaculture training at VIMS

An anonymous donor has provided seed money through the Fidelity Charitable Gift Fund for VIMS' Oyster Aquaculture Training program (OAT), as well as critical operations support for the Institute's Aquaculture Genetics and Breeding Technology Center (ABC).

These gifts have brought significant benefits to the ABC and OAT programs. Since its inception 4 years ago, all 16 OAT participants have successfully completed the program and achieved employment in the industry. VIMS Professor Stan Allen established OAT in 2009 to help meet the demand for trained staff in industry, and to assist the ABC in oyster selection and breeding.

The funding has allowed ABC to expand their research and development in breeding technology into critical areas in response to industry needs. Research initiated this year—including the production of triploid (or spawnless) oysters—was enabled by the additional operating funds obtained through the private donor.



VIMS Dean and Director John Wells with Helga Gottwald and Floyd D. Gottwald, Jr.



2012 interns at VIMS' Eastern Shore Lab. From L: John Keyes, Emilee Dize, Lauren Matthews, Rebecca Turner, and Michael Byrd.



VIMS hatchery specialist Amanda Chesler (L) and ABC director Stan Allen (R) with 2012 OAT graduates Chris Smith, Marga Morris, Elyce Whatley, and Nicole Dunleavy.



Endowed fellowships provide long-term support for field and laboratory work by VIMS graduate students.



The Pathfinder Award, which honors outstanding service and enduring commitment to VIMS, went to Guilford D. Ware, Esquire, a founding member of the VIMS Council and VIMS Foundation Board, former Council Secretary, and current Secretary to the VIMS Foundation. Pictured here with colleague Ann Sullivan, Ware's steadfast friendship and commitment to VIMS continue to support innovation and discovery in marine science.



The Tidewater Oyster Gardeners Association announced the TOGA Fellowship Endowment. From L: John Wells, Jackie Partin, Mike Oesterling, Don Beard, and David Turney.



The Colonial Sail & Power Squadron's third annual "Dinghy Poker Run" raised more than \$3,000 for VIMS. From L: Jennifer Dillon (VIMS' Associate Director of Development), Lieutenant Bill Walsh, Miriam Beckwith (VIMS' Annual Fund and Volunteer Coordinator), Commander Connie Beltz, Staff Commander Kay Simkins, and Past Rear Commander Norma Parrish. Sponsors were Dare Marina, KITCO Fiber Optics, West Marine, West Marine Express, Joe & Mimma's Restaurant, the IHOP in Yorktown, Retail Advisors, Ken Matthews Garden Center, Jesse and Sally White, and Appomattox River Company. Co-sponsors were Virginia Beach Sail and Power, Patuxent River Sail and Power, and Nansemond River Sail and Power.

TOGA reaches endowment milestone

The Tidewater Oyster Gardeners Association reached a giving milestone in April 2012 when contributions to the TOGA Fellowship Endowment in the VIMS Foundation exceeded the \$50,000 minimum. Student support from the endowment will begin in 2013.

TOGA established the endowment in June 2011 with an initial donation of \$27,000. Mr. Don Beard, a leading member of the Northern Neck Oyster Gardeners Association, made significant contributions to the original gift.

TOGA President David Turney says, "We intend for the TOGA endowment to support students working within a broad spectrum of research, including oysters, other shellfish, and the general ecological restoration of Chesapeake Bay." He adds that TOGA intends to continue funding its endowment through future fundraising efforts.

Altria's in-kind gift facilitates environmental studies

The Altria Group of Companies has provided an in-kind gift of scientific equipment—valued at more than \$100,000—that VIMS researchers will use to support studies and monitoring of water quality and ecosystem health in Chesapeake Bay and the coastal ocean.

The gift includes both high-tech instruments like a mass spectro- meter and gas chromatographs to everyday equipment such as lab balances and biosafety cabinets.

Dr. Roger Mann, VIMS' Director of Research and Advisory Services, says the equipment was quickly spoken for when made available to VIMS researchers, with requests from new faculty and teaching labs given highest preference.

Newly arrived Associate Professors Andrew Wargo and B.K. Song will use the equipment to support the start-up of their research programs at VIMS. Wargo, a microbiologist, will use a 37° incubator, a centrifuge, and a tissue-culture hood to support his studies of infectious disease in rainbow trout. Song will use Altria's donated equipment to advance his studies of the role that oysters play in the cycling of nitrogen within shallow-water habitats.

VIMS Dean and Director John Wells says "Altria's in-kind gifts are greatly appreciated both by the VIMS as a whole and by our individual researchers and students. Their generous support helps us continue our mission of research, education, and advisory service to the Commonwealth and nation."



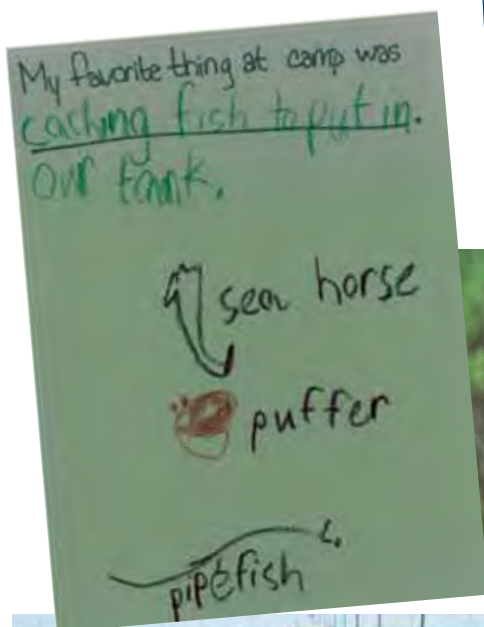
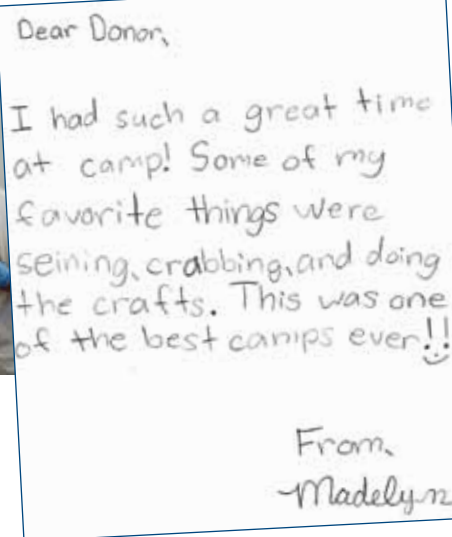
A gift from Adrian G. "Casey" Duplantier Jr., matched by 1st Advantage Federal Credit Union, supports student research with VIMS Professor Deborah Steinberg as part of the Palmer Long-Term Ecological Research program on the Antarctic Peninsula. The VIMS team typically spends six weeks per year aboard a U.S. research vessel studying how the region's rapid warming is affecting the microscopic animals that form the base of the Antarctic food web. The gift has most recently supported VIMS graduate students Josh Stone and Miram Gleiber. From L: Stone, Gleiber, Steinberg, VIMS grad student Brandon Conroy, and technician Kate Ruck.

Summer Camps

The fourth year of VIMS' Summer Camp program brought 102 students to Gloucester Point and the VIMS Eastern Shore Lab in Wachapreague for a week of fun and learning. The camps, funded by an anonymous private donor, continue to grow in popularity with 470 1st through 8th graders applying for one of the 5 weeklong sessions offered in 2012.

The program—organized and led by Sarah McGuire, education coordinator for the Chesapeake Bay National Estuarine Research Reserve Program at VIMS—features four offerings customized for children of different ages. All campers share the enjoyment of hands-on experiences with the waters and critters of Chesapeake Bay and Virginia's coastal ocean, including interactions with blue crabs, insects, and marsh grasses; as well as activities involving canoeing, seining, trawling, dredging, plankton tows, dissection, writing, and artwork.

McGuire says a valuable addition to this year's camps was a "Junior Internship" that allows previous-year campers who are now too old for the program to give back by sharing their knowledge and enthusiasm with this year's attendees.





Anna Murphy with a bay scallop.



Ben Marcek with a white marlin.



Sarah Schillawski Cammer (R) and Christie Pondell (L) at sea.

General Graduate Student Support Endowment

This endowment was created to support a wide range of student needs including research, equipment, travel to scientific conferences, tuition, and stipend support. Currently at \$18,377 in gifts and pledges from many supporters, it will begin funding students once it reaches \$50,000.

Student Fellowships & Awards

Fellowships for students in William & Mary's School of Marine Science at VIMS provide critical support for a wide range of student needs including research equipment, travel to scientific conferences, tuition, and stipends. Student awards recognize and reward qualities that lead to success in graduate school and subsequent careers—including commitment, initiative, scholarship, and interdisciplinary research.

Nichols Student Travel Fellowship

Sarah Schillawski Cammer Following carbon down the stream, in weather fair and foul

VIMS Council Fellowship

Solomon Chak Host use and social organization in sponge-dwelling snapping shrimps

Jon Lefcheck Characterizing biodiversity based on functional traits: methods, large-scale patterns, and links to ecosystem functioning

Barbara & Harry Hager Fellowship

Allison Colden Reef-structure effects on the persistence and performance of restored oyster reefs

Megan Wood Response of juvenile blue crabs to altered nursery habitat

John E. Olney, Sr. Ichthyology Award

Alison Deary Development of the feeding apparatus and senses in the Drums (Family Sciaenidae) from Chesapeake Bay

Ferguson Enterprises Fellowship

Matthew Freedman Impacts of the invasive bivalve *Corbicula fluminea* on the benthic communities of tidal freshwaters

Amy Then Studies of mortality estimation in fish

Hunter Booker Andrews, Jr. Fellowship

Cassandra Glaspie Bivalve predator-prey interactions in Chesapeake Bay

Benjamin Marcek Post-release survival of school-size bluefin tuna caught in the recreational trolling fishery

Joshua Stone Jellyfish population changes in Chesapeake Bay and the Sargasso Sea

Juliette B. & Carroll Owens, Sr. Fellowship

Miram Gleiber Long-term change in copepod community structure in the Western Antarctic Peninsula

Kathleen & Robert Roper, Jr. Fellowship

Daniel Kaufman Investigating natural variability in the waters and life of the Ross Sea, Antarctica

Beazley Fellowship

Patrick Lynch Fish habitats and population dynamics

Gloucester Point Rotary Club Warinner Fellowship

Anna Mosby Phytoplankton growth rates in the Ross Sea, Antarctica

Anna Murphy Evaluating nitrogen cycling in an agro-ecosystem dominated by hard-clam aquaculture

SunTrust Fellowship

Sikai Peng Effects of epibiont ciliates on copepods

Zeigler Fellowship

Lela Schlenker What happens after catch and release? Evaluating the effect of recreational angling on post-release survival and physiological stress in white marlin

Grey Allison & H. Renwick Dunlap Fellowship

Richard Secrist Food sources for farmed clams in aquaculture

Edward Holland Fellowship

Mark Stratton Ecosystem analysis of near-shore fisheries along the U.S. East Coast

Matthew Fontaine Maury Fellowship

Christina Pondell Sediment and organic carbon burial in Englebright Lake, California during the past century

Rouse-Bottom Fellowship

Diane Tulipani Ecological role and conservation of the diamondback terrapin in Chesapeake Bay

John M. and Marilyn Zeigler Student Achievement Award

Samuel Lake Quantifying system metabolism and the drivers of periodic hypoxia in shallow marine estuaries

Note: The William J. Hargis, Jr. Fellowship, the Kelley Watson Fellowship, and the Craig L. Smith Memorial Educational Scholarship were not awarded at the time of this report. These fellowships will be awarded in 2013.

VIMS dedicates Eastern Shore Seawater Facility

A large crowd of dignitaries and friends helped dedicate the new 7,597 square-foot Seawater Facility at VIMS' Eastern Shore Laboratory on June 22nd. The facility—with 8 pumps that provide seawater at rates of up to 1,840 gallons per minute—allows researchers to rear, maintain, and observe marine organisms under conditions that mimic those of the coastal and open ocean, and provides resident and visiting students with an enhanced opportunity for hands-on study of live organisms.



"The facility will bring the Eastern Shore Lab to a new level of scientific excellence and create opportunities for faculty and students to expand our mission of research, education, and advisory service."—VIMS Dean & Director John Wells



"Unique in its easy access to clean, high-salinity seawater"—ESL Director Mark Luckenbach



"A unique facility that promises vital contributions to the health of Chesapeake Bay, the coastal ocean, and Virginia's fisheries."—W&M President Taylor Reveley (R), with Delegate Harvey Morgan.



Visitors view a shark tank during the dedication of the new Seawater Facility at the Eastern Shore Laboratory.



Rick and Marsha Amory with Rich Brill during the dedication.



The new Seawater Facility at the Eastern Shore Laboratory

VIMS Foundation Financial Statements

Statement of Financial Position as of June 30, 2012

| Assets | FY 2012 |
|--|--------------------------------|
| Current Assets | |
| Cash and cash equivalents | \$ 520,414 |
| Pledges receivable | <u>276,908</u> |
| Total Current Assets | <u>797,322</u> |
| Investment in William & Mary Investment Trust | 8,182,478 |
| Other Assets | |
| Pledges receivable | 451,290 |
| TOTAL ASSETS | <u>\$ 9,431,090</u> |
| Liabilities and Net Assets | |
| Liabilities | |
| Accounts payable | <u>\$ 33,712</u> |
| Net Assets | |
| Unrestricted | 817,149 |
| Temporarily restricted | 2,518,470 |
| Permanently restricted | <u>6,061,759</u> |
| Total Net Assets | <u>9,397,378</u> |
| TOTAL LIABILITIES AND NET ASSETS | <u>\$9,431,090</u> |

VIMS Foundation

Financial Statements (Continued)

Statement of Activities for the Year Ended June 30, 2012

| | Unrestricted | Temporarily Restricted | Permanently Restricted | Total |
|---|--------------------------|----------------------------|----------------------------|----------------------------|
| Revenue, Gains and Other Support | | | | |
| Contributions | \$ 113,157 | \$ 147,455 | \$ 1,243,308 | \$ 1,503,920 |
| Net investment income (loss) | (30,882) | (52,542) | - | (83,424) |
| | 82,275 | 94,913 | 1,243,308 | 1,420,496 |
| Net assets released from restrictions | <u>432,962</u> | <u>(432,962)</u> | <u>-</u> | <u>-</u> |
| Total Revenue, Gains and Other Support | <u>515,237</u> | <u>(338,049)</u> | <u>1,243,308</u> | <u>1,420,496</u> |
| Expenses | | | | |
| Program services | | | | |
| Instruction | 88,642 | - | - | 88,642 |
| Research | 295,751 | - | - | 295,751 |
| Academic support | 10,320 | - | - | 10,320 |
| Institutional support | 110,165 | - | - | 110,165 |
| Student financial assistance | 52,422 | - | - | 52,422 |
| Public support | 1,000 | - | - | 1,000 |
| Management and general | 65,112 | - | - | 65,112 |
| Fundraising | <u>22,623</u> | <u>-</u> | <u>-</u> | <u>22,623</u> |
| Total Expenses | <u>646,035</u> | <u>-</u> | <u>-</u> | <u>646,035</u> |
| Change in Net Assets | (130,798) | (338,049) | 1,243,308 | 774,461 |
| Net assets, beginning of year | <u>947,947</u> | <u>2,856,519</u> | <u>4,818,451</u> | <u>8,622,917</u> |
| NET ASSETS, END OF YEAR | <u>\$ 817,149</u> | <u>\$ 2,518,470</u> | <u>\$ 6,061,759</u> | <u>\$ 9,397,378</u> |

*The selected financial information presented was extracted from the financial statements audited by McPhillips, Roberts & Deans, PLC.

VIMS Foundation and the W & M Investment Trust

The VIMS Foundation benefits from a larger investment pool by participating in the William & Mary Investment Trust ("WAMIT") for its investable assets. VIMS and its School of Marine Science are a part of the College of William & Mary.

As of June 30, 2012, the consolidated endowment for William & Mary totaled \$644.2 million—an increase of \$19.5 million, or 3.1% compared to last year's total and another new high watermark. Strong gift flow and substantial increases in the value of assets held in external trusts were the main drivers of asset growth. While matching its blended benchmark, investment performance limited overall growth as WAMIT, the largest of the investment portfolios, earned a -1.4% rate of return for the fiscal year ending June 30, 2012. This performance reflected the present difficulties of investing in the challenging, at times turbulent, environment of today's inter-connected global economies.

The composition of WAMIT's policy benchmark reflects WAMIT's broadly diversified investments. The blended policy benchmark comprises a 56% weighting to the MSCI All Country World Index, a 24% weighting to the Barclays Capital U.S. Aggregate Bond Index, a 2% weighting to the Barclays Capital U.S. Credit Index, an 8% weighting to the Barclays Capital U.S. High Yield Index, and a 10% weighting to the Dow Jones-UBS Commodity Index.

Domestic stocks, representing all cap sizes, make up 19.9% of the portfolio—up 1.5% from last year's June 30 weighting of 18.4%. WAMIT's domestic equity managers returned a composite of 4.1% for the year, outperforming the broad Russell 3000 Index, which returned 3.8%. Comparatively, the large cap S&P 500 Index returned 5.5% for the fiscal year.

Foreign equity invested in developed regions of Europe, Asia, and the Far East had a portfolio representation of 10.3% as of June 30, reduced slightly from last year's weighting at 10.5%. Despite investment performance of -7.9%, our participation in developed foreign markets was significantly better than the -13.8% benchmark return of the MSCI EAFE Index. During the course of the year, investments in the emerging markets decreased from about 8% to 6.2% of the portfolio. Plagued by uncertainties in the global markets and accompanying negative sentiment, the emerging markets felt the brunt of investors' nervousness and compelling need to decrease risk. WAMIT's exposure to the emerging markets produced our largest disappointment with a return of -17.1%, trailing the benchmark return of the MSCI Emerging Markets Index of -15.7% by some 1.4%.

WAMIT's exposure to Marketable Alternatives comes in two component asset classes: Absolute Return and Special Situations. Generally, investments in Absolute Return are those designed to consistently produce a positive return that would at a minimum equate to the yield of inflation plus

spending (typically high single digits). Investments in Special Situations are opportunistic in nature and consequently reflect strategies that seek to maximize returns from situations perceived to be temporary aberrations in market pricing or where specific financing can measurably improve asset quality and a company's balance sheet. Together, Absolute Return and Special Situations comprised 33.1% of the WAMIT portfolio as of June 30, 2012, down slightly from a 36.1% allocation the year before, and returned -0.9%. Individually, managers in our Absolute Return category had a tough year navigating the choppy waters in the alternative space, generating a -2.9% return. However the category fared better than the collective aggregate that comprises the benchmark HFR Fund of Funds Composite, which returned

-4.4%. Managers in Special Situations, predominantly those engaged in credit and restructuring strategies, produced a 2.5% return, well exceeding the HFR Distressed Securities benchmark which returned -3.4%.

Private Equity constituted approximately 9.3% of total assets at June 30, 2012, up from 6.6% at the end of the prior year.

With WAMIT's targeted policy allocation at 12%, the private equity portion of the portfolio remains conspicuously beneath our preferred exposure level. However some newer commitments are now beginning to call capital and other opportunities continue to be examined with careful due diligence. Private equity had a 3.1% return in 2012. The benchmark used for private equity is the Russell 3000 Index, reflecting what we perceive to be the opportunity cost in deviating from the broad public market. This benchmark returned 3.8% for the year.

The fixed income portion of the portfolio returned 7% for the fiscal year. This compares to the 7.5% return of the Barclays Capital U.S. Aggregate Bond Index. In Real Assets, an asset class comprised of investments in commodities, natural resources (oil, gas, and timber), and equity real estate, WAMIT's blended exposures had a combined return of 2.7%, out-performing the Dow Jones-UBS Commodity Index of -14.3% by an impressive 17%. At June 30, 2012, fixed income carried an 8.7% weight in the portfolio, real assets a 9.0% weight, and cash a 3.3% weight with a corresponding amount slightly in excess of \$13.6 million.

As of June 30, 2012, the Investments Committee had oversight responsibility of approximately \$417 million in investable assets contained within WAMIT. At that time, representative ownership in WAMIT consisted of 87.4% belonging to The College of William & Mary Foundation, 5.9% to the Marshall-Wythe School of Law Foundation, 4.7% to the William & Mary School of Business Foundation, and 2.0% to the VIMS Foundation. Collectively, WAMIT investments represent approximately 64.7% of the \$644.2 million in total endowment resources that benefit William & Mary.

Investment Results

As of June 30, 2012 - Net of Fees

| | 1 YEAR | 3 YEARS | 5 YEARS |
|---|--------|---------|---------|
| The William and Mary Investment Trust (WAMIT) | -1.4% | 8.9% | 1.2% |
| Blended Benchmark | -1.4% | 12.0% | 0.3% |
| Value Added | 0.0% | -3.1% | +0.9% |

Policy Benchmark: 56% MSCI All Country World Index, 24% Barclays Capital U.S. Aggregate Bond Index, 2% Barclays Capital U.S. Credit Index, 8% Barclays Capital U.S. High Yield Index, 10% Dow Jones-UBS Commodity Index

The William and Mary Investment Trust: Asset Allocation of Policy Portfolio

| Fiscal Year 2012 | June 30, 2012 Allocation |
|--------------------------|-----------------------------|
| Domestic Equities | 19.9% |
| Foreign Equities | 10.3% |
| Emerging Market Equities | 6.2% |
| Fixed Income | 8.7% |
| Special Situations | 11.4% |
| Absolute Return | 21.7% |
| Real Assets | 9.0% |
| Private Equity | 9.3% |
| Cash | 3.3% |
| Distributed Securities | 0.2% |

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The Virginia Institute of Marine Science is proud to recognize the following individuals, corporations, and foundations that have generously supported its work with lifetime gifts of \$100,000 or more

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The Maury Society

Named for the "Pathfinder of the Seas" Matthew Fontaine Maury, the Maury Society recognizes donors who make an annual gift of \$1,000 or more. This group of dedicated patrons helps VIMS to continue Maury's tradition of scientific discovery.

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Mrs. Jennifer B. Latour and
Dr. Rob Latour
Dr. John A. Musick and
Ms. Beverly McMillan
Julie Ann Wrigley Foundation

In Memory of Dr. James M. Peery
Dr. and Mrs. John S. Peery

In Memory of Mrs. Mary Rigby
Tinkham
Mr. H. Stetson Tinkham

In Memory of Dr. John M. Zeigler
Ms. Ellen Fisher

VIMS Financials Fiscal Year 2011-2012

Unaudited

REVENUE

| | |
|-------------------------|----------------|
| General Fund | \$16,941,420 |
| Nongeneral Funds | |
| Tuition and Other Funds | 2,464,708 |
| Federal Stimulus | 420,304 |
| Grants & Contracts | 20,281,919 |
| Private Funds* | <u>780,838</u> |

Total Revenue \$40,889,189

EXPENDITURES

| | |
|--------------------------------|-------------|
| Instruction | \$1,500,739 |
| Research and Advisory Services | 8,431,530 |
| Public Service | 1,000 |
| Academic Support | 4,303,978 |
| Institutional Support | 2,033,506 |
| Plant Operations | 3,972,685 |
| Student Financial Assistance | 310,370 |
| Sponsored Programs** | 20,281,919 |

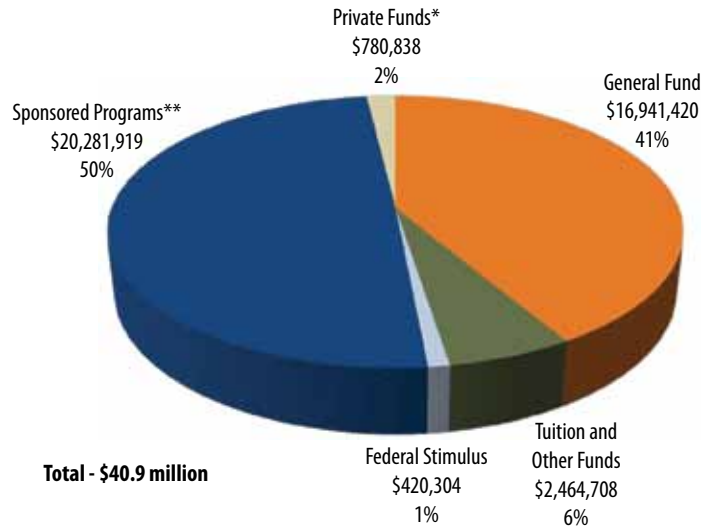
Total Expenditures \$40,835,727

CAPITAL EXPENDITURES \$1,701,053

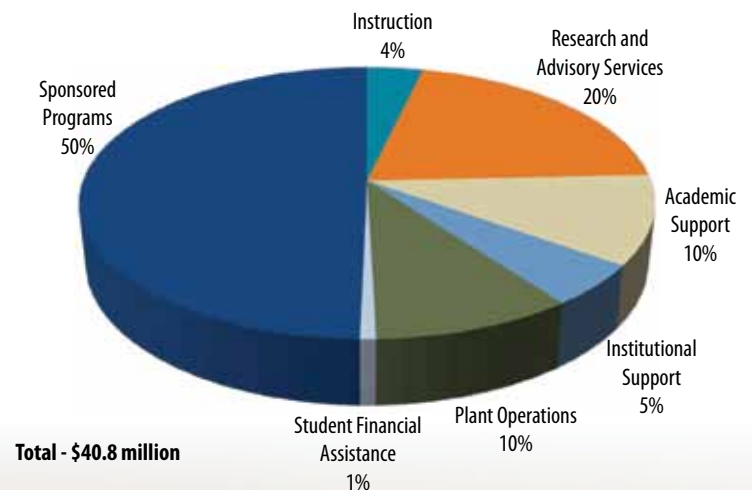
* Private funds revenue includes program support to VIMS from the VIMS Foundation.

** Sponsored Programs revenue includes Grant & Contract expended revenues.

FY 2011-12 Revenue



FY 2011-12 Expenditures



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VIMS Foundation

Richard T. White, Director of Facilities Management

2012 Maury Dinner



W&M President Taylor Reveley addresses the audience.



VIMS graduate student Kristen Omori talks with Ken Hammond.



Pamela Faggert, Mark Luckenbach, Jeff Jones, and Don Faggert enjoy the reception.



From L: Carroll Owens, Rick Amory, Patty Whittemore, and Case Whittemore before the start of the Maury Dinner.

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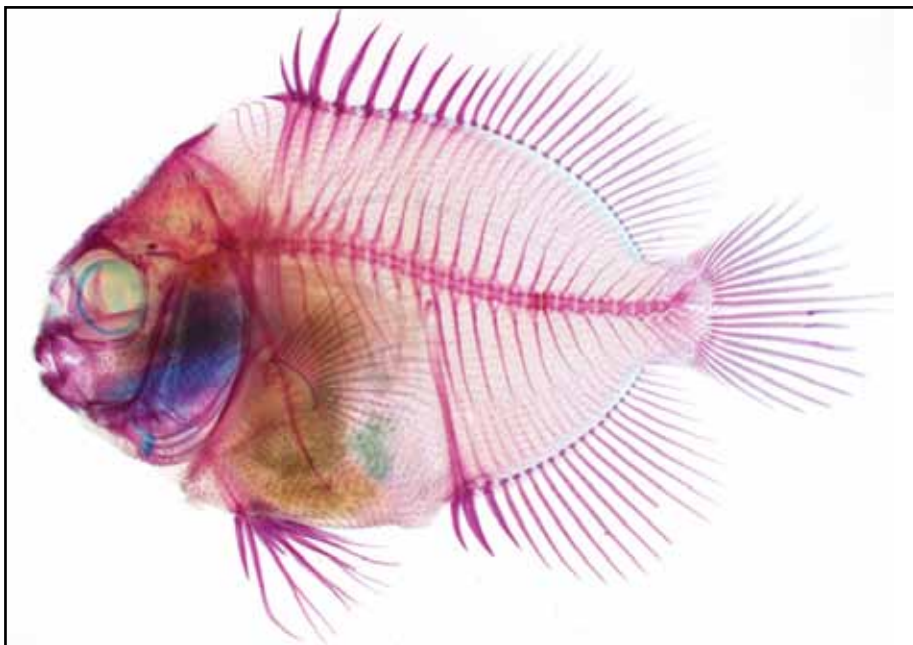
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*newly elected

2012 VIMS Photo Contest



1st Place: Alison Deary

This larval spadefish has been cleared and stained to indicate calcified (red) and uncalcified (blue) structures. Only 23 days old, it has already developed a great deal of calcification.



2nd Place: Miram Gleiber

Calm waters mirror the research vessel *Laurence M. Gould* in Neko Harbor on the Western Antarctic Peninsula during the Palmer LTER research cruise.



3rd place: Solomon Chak

VIMS researchers are studying sociality in sponge-dwelling snapping shrimps. Distinguishing different species requires careful observation under the light microscope.

Honorable Mentions



Steven Baer - Aurora borealis



Jessica Bergeron - Georges Bank sunset



Miram Gleiber - What will be in the net?



Janet Krenn - Retrieving buoy



Pam Reynolds - North Carolina seining

**Virginia Institute of Marine Science
College of William and Mary
P.O. Box 1346
Gloucester Point, VA 23062 USA
804.684.7000 | www.vims.edu**

Save the Date

**Marine Science Day Open House
May 18, 2013**

Cover photo: Budding ecologists Jessica Braunstein (L) and
Julia Johnston(R) in the Poquoson River.
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